REMARKS

Claims 3-4, 9-12, 14-15, and 17-18 are withdrawn. Claim 5 has been cancelled.

Claim 1 has been amended to recite "[a] process for the production of L-ascorbic acid comprising:

(a) contacting an enzyme with a substrate which is selected from the group consisting of L-gulose, L-galactose, L-idose, and L-talose;

(b) converting the substrate into L-ascorbic acid by catalytical activity of the enzyme under suitable culture conditions; and

(c) isolating L-ascorbic acid from the reaction mixture,

wherein said enzyme has (1) the amino acid sequence of SEQ ID NO: 2 or (2) an amino acid sequence with 90% sequence identity to SEQ ID NO: 2 and with the activity to produce L-ascorbic acid or (3) an amino acid sequence encoded by the DNA sequence of SEQ ID NO: 1 or (4) an amino acid sequence encoded by a DNA sequence that hybridizes under stringent hybridization and wash conditions to the DNA sequence of SEQ ID: 1 and having the activity to produce L-ascorbic acid." Support for this amendment is found in the specification at, for example, page 1, lines 1-2; page 2, lines 8-12; page 7, lines 10-27; in Examples 1-4; and in original claims 1 and 5. *See In re Gardner*, 177 USPQ 396, 397 (CCPA 1973) and MPEP §§ 608.01(o) and (l) (8th ed. Rev. 5, August 2006, pp. 600-92 and 600-84).

Claim 2 has been amended to recite "[a] process for the production of L-ascorbic acid with an enzyme having (1) the amino acid sequence of SEQ ID NO: 2 or (2) an amino acid sequence with 90% sequence identity to SEQ ID NO: 2 and with the

activity to produce L-ascorbic acid or (3) an amino acid sequence encoded by the DNA sequence of SEQ ID NO: 1 or (4) an amino acid sequence encoded by a DNA sequence that hybridizes under stringent hybridization and wash conditions to the DNA sequence of SEQ ID: 1 and having the activity to produce L-ascorbic acid, whereby L-ascorbic acid is produced from a substrate which is selected from the group consisting of L-gulono-1,4-lactone, L-gulonic acid, L-galactono-1,4-lactone, L-galactonic acid, L-idono-1,4-lactone, L-idonic acid, L-talono-1,4-lactone, and L-talonic acid,

said process comprising the steps of:

(a) contacting the enzyme with the substrate,

(b) converting the substrate into L-ascorbic acid by catalytical activity of the enzyme under suitable culture conditions; and

(c) isolating L-ascorbic acid from the reaction mixture." Support for this amendment is found in the specification at, for example, page 1, lines 1-2; page 2, lines 8-12; page 7, lines 10-27; in Examples 1-4; and in original claims 2 and 5. *See id.*

Claim 8 has been amended to recite "[a] process for producing L-ascorbic acid comprising (a) contacting a substrate which is selected from the group consisting of L-gulose, L-galactose, L-idose, L-talose, L-gulono-1,4-lactone, L-gulonic acid, L-galactono-1,4-lactone, and L-galactonic acid with an enzyme derivable from *G. oxydans* DSM 4025, (b) converting the substrate into L-ascorbic acid by catalytical activity of the enzyme under suitable culture conditions and (c) isolating L-ascorbic acid from the reaction mixture; wherein the enzyme has the following physico-chemical properties ...." Support for this amendment is found in the specification at, for example, page 1, lines

1-2; page 2, lines 8-12; page 7, lines 10-27; in Examples 1-4; and in original claims 5 and 8. *See id.*

Claim 16 has been amended to depend from claim 8 instead of cancelled claim 5.

It is submitted that no new matter has been introduced by the foregoing amendments. Approval and entry of the amendments is respectfully solicited.

Indefiniteness Rejection

Claims 1, 2, 5-7, 13, and 16 were rejected under 35 USC § 112, second paragraph. (Paper No. 20060728 at 4).

For the reasons set forth below, the rejection has been rendered moot.

In making the rejection, the Examiner asserted that claims 1 and 2 recite the phrase "'... [that is] 90% identical ...,' the metes and bounds of the phrase is not clear." The Examiner instructed that claims 1 and 2 be amended to recite "with 90% sequence identity." (*Id.*)

With a view towards furthering prosecution, claims 1 (from which claims 6-7 depend) and 2 (from which claims 5, 13, and 16 depend) have been amended to recite "with 90% sequence identity," as required by the Examiner. In view of the foregoing amendment, the rejection of claims 1, 2, 5-7, 13, and 16 has been rendered moot. Accordingly, withdrawal of the rejection is respectfully requested.

Enablement Rejection

Claims 1-2, 5-7, 13, and 16 have been rejected under 35 U.S.C. § 112, first paragraph, for lack of enablement. (Paper No. 20060728 at 4-5).

In making the rejection, the Examiner asserted that "the specification ... does not reasonably provide enablement for production of L-ascorbic acid" from a defined substrate using an enzyme that "has an amino acid sequence 90% identical to SEQ ID NO: 2 or thereto from any source including variants, mutants and recombinants, with the activity to produce L-ascorbic acid under specific defined process conditions such as pH, temperature and time in which the substrates are allowed to react with said enzyme." (*Id.* at 4-5). The Examiner acknowledged, however, that the specification is "enabling for production of L-ascorbic acid" from a defined substrate using an enzyme that "has the amino acid sequence of SEQ ID NO: 2 with the activity to produce L-ascorbic acid under specific defined process conditions such as pH, temperature and time in which the substrates are allowed to react with the said enzyme." (*Id.* at 4).

At bottom, the rejection recognizes that the claims are enabled for the specific enzyme recited, but not for highly homologous enzymes, *i.e.*, those that are at least 90% identical and have the same function as the recited enzyme.

As is well settled, it is the Examiner's burden to demonstrate that a specification is not sufficiently enabling. *In re Marzocchi*, 169 USPQ 367, 369 (CCPA 1971). To carry his/her burden, the Examiner must identify and clearly articulate the factual bases and supporting evidence that allegedly establish that undue experimentation would be required to carry out the claimed invention. *Id.* at 370.

The rejection, however, completely fails to identify or articulate any factual basis or supporting evidence to establish that undue experimentation is required to practice the invention. At best, the Examiner asserts that "[t]he specification is limited

to teaching the use of an enzyme having the amino acid sequence of SEQ ID NO: 2 with the activity to produce L-ascorbic acid under specific defined process conditions ..., but provides no guidance with regard to the making of other variants, mutants and recombinants from any source or with regard to other uses." (Paper No. 20060728 at 6). This conclusory statement falls short for at least two reasons. First, it impermissibly shifts the burden to the Applicant absent a *prime facie* case by the Examiner. Second, the statement ignores unambiguous disclosure in the specification how to make and screen for highly homologous enzymes having the same function as the recited enzymes.

With respect to the first deficiency, we note that "[i]n order to make a rejection, ***the examiner has the initial burden*** to establish a reasonable basis to question the enablement provided for the claimed invention.... ***[T]he minimal requirement is for the examiner to give reasons*** for the uncertainty of the enablement. ***This standard is applicable even when there is no evidence in the record of operability without undue experimentation beyond the disclosed embodiments***." MPEP § 2164.04 (8th ed. Rev. 5, August 2006, p. 2100-191) (emphasis added).

Thus, it is simply not enough to attempt shift the burden to the applicant by asserting that the specification does not contain evidence of enablement, as the Examiner does here. At bottom, the rejection is completely devoid of the factual basis or supporting evidence required to establish a *prima facie* case for lack of enablement.

We further note that independent claims 1, 2, and 8 have been amended for purposes of clarity. As amended, these claims recite, *inter alia*, "converting the

substrate into L-ascorbic acid by catalytical activity of the enzyme under suitable culture conditions." Thus, amended claims 1, 2, and 8 clearly recite a process that, *inter alia*, is a direct conversion of a recited substrate into L-ascorbic acid via Enzyme B (or highly homologous enzymes having the same function as Enzyme B) acting as a biocatalyst. For this reason alone, the rejection should be withdrawn.

As is well accepted, even a "considerable amount" of experimentation is permissible if it is merely routine or if the specification provides a reasonable amount of guidance. MPEP § 2164.05 and *In re Wands*, 8 USPQ at 1404. In addition, "a patent need not teach, and preferably omits, what is well known in the art." MPEP § 2164.01 (8th ed. Rev. 5, August 2006, p. 2100-187) *citing In re Buchner*, 929 F.2d 660, 661, 18 USPQ2d 1331, 1332 (Fed. Cir. 1991); *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1384, 231 USPQ 81, 94 (Fed. Cir. 1986), *cert. denied*, 480 U.S. 947 (1987); and *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1463, 221 USPQ 481, 489 (Fed. Cir. 1984).

Here, the Applicants have developed a novel process for direct production of L-ascorbic acid using an enzyme, which previously had been known but for another purpose or catalytic reaction. The currently amended claims define the process steps required for a direct one-step conversion of a substrate into L-ascorbic acid, the process being catalyzed by an enzyme of the present invention. The specification gives several examples of enzymes encompassed by the claims, including functional equivalents, enzymes encoded by DNA which hybridize to the DNA of SEQ. ID NO:1, and mutants generated by various listed methods. (*See, e.g.*, Specification at pages 4-5). Indeed, the specification exemplifies 34 different amino acid substitutions and

different screening assays for identifying functionally equivalent mutants. (*See* Specification at page 4). Therefore, the specification clearly enables the skilled person to identify enzymes in order to perform the presently claimed process, particularly in view of the fact that the physico-chemical properties (such as pH-optimum, pH-stability, substrate specificity, and molecular weight) as well as the amino acid and nucleotide sequences are known.

For example, the specification discloses the physico-chemical properties of Enzyme B of *G. oxydans* DSM 4025 as having:

(a) molecular weight of about 60,000 Da on SDS-PAGE;

(b) substrate specificity for primary and secondary alcohols and aldehydes;

(c) pH-stability at pH of about 6 to about 9;

(d) pH-optimum at pH of about 8.0; and

(e) inhibited by Cu^{2+}, Zn^{2+}, Mn^{2+}, Fe^{2}, and Fe^{3+}.

(Specification at page 1, lines 22-28). The specification also discloses the amino acid sequence and nucleotide sequence for Enzyme B represented by SEQ ID NO: 2 and SEQ ID NO: 1, respectively. (*Id.* at page 2, lines 1-5). In addition, the specification discloses that "functional equivalents of the enzyme can be made either by chemical peptide synthesis known in the art or by recombinant means on the basis of the DNA sequences as disclosed herein by methods known in the state of the art. Amino acid exchanges in proteins and peptides which do not generally alter the activity of such molecules are known in the state of the art." (*Id.* at page 4, lines 1-8). And, as an example of a functional equivalent, the specification discloses that a "functional

equivalent of the enzyme includes an amino acid sequence encoded by a DNA sequence of SEQ ID NO: 1 ... as well as the complementary strand, or those which include the sequences, DNA sequences which hybridize under standard conditions with such sequences or fragments thereof ...." (*Id.* at page 4, lines 9-21). The specification also discloses that "[a] mutant of the gene can be prepared by treating the gene or a microorganism carrying the gene with a mutagen such as ultraviolet irradiation, X-ray irradiation, γ-ray irradiation or contact with a nitrous acid, N-methyl-N'-nitro-N-nitrosoguanidine (NTG), or other suitable mutagens, or isolating a colony or clone occurring by spontaneous mutation or by standard methods of in vitro mutagenesis known in the art. Many of these methods have been described in various publications." (*Id.* at page 4, lines 31-36). The specification also contains four examples (Examples 1-4) that include assays for identifying enzymes that meet the recited elements of the claims.

In sum, the specification and knowledge in the art provide ample guidance to allow one of skill in the art to practice the currently claimed invention without undue experimentation. Accordingly, the rejection is factually insufficient to support a rejection for lack of enablement, and for this reason also, the rejection should be withdrawn.

For the reasons set forth above, the enablement rejection should be withdrawn.

Rejection under 35 U.S.C. § 102(b):

Claims 1, 2, 5-8, 13, and 16 were rejected under 35 USC § 102(b) as anticipated by Asakura *et al.*, EP 0 832 974 A2 ("Asakura"). (Paper No. 20060728 at 9).

For the reasons set forth below, the rejection, has been rendered moot.

Asakura discloses "a recombinant enzyme preparation having an alcohol and/or aldehyde dehydrogenase activity which comprises one or more enzymatic polypeptide(s) selected from the group consisting of polypeptides which are identified by SEQ ID NO 5, SEQ ID NO 6, SEQ ID NO 7, and SEQ ID NO 8 ...." (Abstract). "[T]he AADHs provided ... can catalyze the oxidation of L-sorbose to 2KGA via L-sorbosone and/or the oxidation of D-sorbitol to L-sorbose. More particularly, the AADHs provided ... contain Enzyme A, Enzyme A', Enzyme A", and Enzyme B, which have the amino acid sequences shown in SEQ ID NO. 5, 6, 7, and 8, respectively." (Page 6, lines 5-10). Asakura further discloses at Table 1 the substrate specificities for Enzyme A, Enzyme A', Enzyme A", and Enzyme B using n-propanol, isopropanol, D-glucose, D-sorbitol, L-sorbosone, D-mannitol, L-sorbose, and D-fructose. (Page 7, lines 5-33).

In making the rejection, the Examiner asserted that Asakura "disclose[s] the purification, kinetic profiles and physico-chemical characterization of a polypeptide designated as Enzyme B from *G. oxydans* DSM 4025 that has 100% sequence homology to SEQ ID NO: 2 of the instant application with identical physico-chemical properties and substrate specificity for primary and secondary alcohols, optimal pH range, pH stability, thermal stability and effect of metals and inhibitors on the activity of said enzyme (Table: 1, 2 , 3 , 4 and 5)." (Paper No. 20060728 at 9-10). The Examiner further asserted that "Table 10, page 23 discloses L-idose as a substrate for Enzyme B and the formation of L-idonic acid and the use of said enzyme in a process for the production of L-ascorbic acid and the intermediates of L-ascorbic acid (Abstract

section). (*Id.* at 10). The Examiner then concluded that Asakura "anticipates" claims 1,2, 5-8, 13, and 16. (*Id.*).

As is well settled, anticipation requires "identity of invention." *Glaverbel Societe Anonyme v. Northlake Mktg. & Supply,* 33 USPQ2d 1496, 1498 (Fed. Cir. 1995). Each and every element recited in a claim must be found in a single ***prior art reference*** and arranged as in the claim. *In re Marshall*, 198 USPQ 344, 346 (CCPA 1978); *Lindemann Maschinenfabrik GMBH v. American Hoist and Derrick Co.,* 221 USPQ 481, 485 (Fed. Cir 1984). "Moreover, it is incumbent upon the Examiner to ***identify wherein each and every facet*** of the claimed invention is disclosed in the applied reference." *Ex parte Levy*, 17 USPQ2d 1461, 1462 (BPAI 1990). The Examiner is required to point to the disclosure in the reference "***by page and line***" upon which the claim allegedly reads. *Chiong v. Roland*, 17 USPQ2d 1541, 1543 (BPAI 1990).

As amended, independent claims 1, 2, and 8 recite, *inter alia*, "converting the substrate into L-ascorbic acid by catalytical activity of the enzyme under suitable culture conditions." One skilled in the art would clearly recognize these claims as reciting a direct conversion of the recited substrates into L-ascorbic acid via the recited enzyme acting as a biocatalyst, without any further steps needed or intermediates being formed.

The specific use of the recited enzyme for a direct one step-conversion of the claimed substrates into L-ascorbic acid is ***not*** disclosed by Asakura. Asakura discloses a process for the conversion of several substrates (see Table 10) into products including, e.g., D-gluconic acid, L-sorbose, 2-KGA, D-fructose, L-idonic acid.

None of the disclosed products is the currently claimed L-ascorbic acid. As discussed, the currently claimed process does not require any chemical step or isolation of an intermediate, such as, for example, 2-KGA, in order to arrive to the final product, L-ascorbic acid. Thus, Asakura ***fails*** to disclose or suggest direct conversion of any substrates, *e.g.*, L-idose to L-ascorbic acid as currently claimed. Accordingly, the rejection is insufficient as a matter of law and fact to support a conclusion of anticipation, and for this reason, the rejection should be withdrawn.

In view of the claim amendments, the rejection has been rendered moot and should be withdrawn.

Rejection under 35 U.S.C. § 103:

Claims 1, 2, 5-8, 13, and 16 were rejected under 35 USC § 103 as being unpatentable over Asakura in view of Boudrant, J., *"Microbial Processes for Ascorbic Acid Biosynthesis: A Review,"* Enzyme Microb. Technol. v. 12, pp. 322-329 (1990) ("Boudrant") and Hancock, R. and Viola, R., *"Biotechnological Approaches for L-Ascorbic Acid Production,"* Trends in Biotechnology, v. 20, no. 7, pp. 299-305 (2002) ("Hancock"). (Paper No. 20060728 at 11).

The rejection respectfully is traversed. At the outset we note that all arguments made in this paper concerning the art, the other rejections, etc. are readopted and reasserted with respect to this rejection as if fully set forth here. Accordingly, the earlier explanation of why the anticipation rejection fails applies with equal force to this obviousness rejection.

Asakura is summarized above.

Boudrant discloses that "L-Ascorbic acid is an important product currently made using the Reichstein process, which is mainly chemical. Recently, bacteria have been identified that are able to transform in a very efficient way glucose to 2,5-keto-D-gluconic acid and this product to 2-keto-L-idonic acid, precursor of L-ascorbic acid. When the corresponding strains are used together, it is possible to get 2-keto-L-idonic acid directly from glucose. Moreover, new strains have been constructed by introducing a gene from a strain responsible for the second step into a strain responsible for the first step. By using one of the new strains, the transformation can be performed in a single step with only one strain." (Abstract).

Boudrant discloses that "[a]t present there are six bacterial fermentation processes for vitamin C production. However, all of these processes give as a direct precursor of L-ascorbic acid, 2-keto-L-gulonic acid, which is also called 2-keto-L-idonic acid." (Pages 322-323). "The different pathways, named after one of their main metabolic intermediates, are the following:

1. Sorbitol pathway;
2. L-idonic acid pathway;
3. L-gulonic acid pathway;
4. 2-keto-D-gluconic acid pathway;
5. 2-5-diketo-D-gluconic acid pathway;
6. 2-keto-L-gulonic acid pathway."

(Page 323).

Hancock discloses "the development of biotechnological alternatives for the synthesis of Reichstein intermediates by industrial microorganisms. The recent elucidation of the plant biosynthetic pathway represents new opportunities not only for the direct synthesis of $_{L}$-AA by fermentation but also for the production of human crop plants and animal fodder with enhanced nutritional value." (Abstract). Hancock states

in its conclusion that "[t]he Reichstein process has come to the end of its reign," and [r]ecent advances in our understanding of $_{L}$-AA biosynthesis in plants and $_{D}$-EAA biosynthesis in yeast will pave the way for the development of novel methods for direct $_{L}$-AA production." (Page 304).

In making the rejection, the Examiner relied on Asakura, the primary reference, as "teach[ing] the purification, kinetic profiles and physico-chemical characterization of a polypeptide designated as Enzyme B from *G.oxydans* DSM 4025 that has 100% sequence homology to SEQ ID NO: 2 of the instant application with identical physicochemical properties and substrate specificity (as discussed in 102 (b)) rejection above)." (Paper No. 20060728 at 11).

The Examiner acknowledged, however, that Asakura "is silent regarding [] some of the substrates selected from the group L-gulose, L-galactose, L-talose, L-gulono-1,4-lactone, L-gulonic acid, L-galactono-1,4-lactone, L-galactonic acid, L-idono-1,4-lactone, L-talono-1,4-lactone and L-talonic acid." (*Id.*).

To fill the acknowledged gap, the Examiner relied on Boudrant and Hancock for "teach[ing] the different processes and conditions for the production of L-ascorbic acid, such as The Reichstein process, Bacterial fermentation processes and the different pathways, substrates and products such as L-sorbose, L-gulonic acid, L-idonic acid to 2,keto-L-gulonic acid or 2,keto-L-idonic acid utilized by bacteria and the enzymes produced by the bacteria in the production of L-ascorbic acid (entire document)." (*Id.* at 11-12).

The Examiner then concluded that "[c]ombining the teachings of the above references, it would have been obvious to one of ordinary skill in the art at the

time of the instant invention to develop a process for the production of L-ascorbic acid using the enzyme taught by Asakura et al., wherein they disclose the different substrates and intermediate products made by Enzyme B from *G.oxydans* DSM 4025 including the substrate L-idose and intermediate product L-idonic acid and further suggest enzyme's use in L-ascorbic acid synthesis. One of ordinary skill in the art would have been motivated to make or use such an enzyme in the production of L-ascorbic acid and one of ordinary skill in the art would have had a reasonable expectation of success, since the references of Bourdant et al., and Hancock et al., (supra) teach the various pathways and a list of intermediates and substrates that can be employed for the production of L-ascorbic acid, further strengthening the motivation and reasonable expectation of success to use Enzyme B of *G.oxydans* DSM 4025 with the substrates disclosed in the present invention for the production of L-ascorbic acid." (*Id.* at 12).

It is well settled that the Examiner bears the burden to set forth a *prima facie* case of unpatentability. *In re Glaug*, 62 USPQ2d 1151, 1152 (Fed. Cir. 2002); *In re Oetiker*, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); and *In re Piasecki*, 223 USPQ 785, 788 (Fed. Cir. 1984). If the PTO fails to meet its burden, then the applicant is entitled to a patent. *Glaug*, 62 USPQ2d at 1152.

When patentability turns on the question of obviousness, as here, the search for and analysis of the prior art by the PTO must include evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to select and combine the documents relied on by the Examiner as evidence of obviousness. *McGinley v. Franklin Sports*, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001). The factual

inquiry whether to combine documents must be thorough and searching. And, as is well settled, the teaching, motivation, or suggestion to combine "***must be based on objective evidence of record***." *In re Lee*, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002). Furthermore, "[t]o establish prima facie obviousness of a claimed invention, ***all claim limitations must be taught or suggested by the prior art***." MPEP § 2143.03, citing *In re Royka*, 180 USPQ 580 (CCPA 1974).

Here, even if Boudrant and Hancock were properly combinable with Asakura, which they are not, the proposed combination still would not disclose the currently claimed process. Boudrant discloses the biotransformation of D-glucose via several intermediates into 2-keto-L-gulonic acid (2-KGA) or 2-keto-L-idonic acid by the help of various bacteria. The final intermediates, *i.e.*, 2-keto-L-gulonic acid (2-KGA) or 2-keto-L-idonic acid, are then ***further processed via chemical transformation*** to L-ascorbic acid (*see, e.g.*, page 326, paragraph 4, left column, and Figure 2). Boudrant speculates that it would be useful to have a process with only one biotransformation step. In other words, a process wherein the last step, *i.e.*, conversion of 2-KGA into L-ascorbic acid, would also be performed via a microbial process. (*See* page 327, last paragraph, right column). Because this conversion includes both a reduction and an oxidoreduction, Boudrant suggests that at least two enzymes would be required to perform said conversion. (*Id.*). Following the disclosure of Boudrant and starting from L-idonic acid as one intermediate mentioned therein, one would require at least 3 enzymes to reach L-ascorbic acid. (*See* Figure 2 in connection with page 327, last paragraph, right column). The currently claimed process, however, requires something

completely different, *i.e.*, the production of L-ascorbic acid from the recited substrates using only one specific enzyme. Thus, Boudrant does not fill the gap in Asakura.

Similarly, Hancock discloses a summary of the then currently known bacterial biotransformation processes starting from D-glucose. Also, just like Boudrant, Hancock discloses that the biological process ends with 2-KGA, which is then followed by chemical conversion to arrive at L-ascorbic acid. (See, e.g., page 300, Figure 2). Hancock further *speculates* on a bioconversion from D-glucose via 2-KGA to L-ascorbic acid. (*See* page 302, second paragraph, left column). However, there is no suggestion or disclosure of a bacterial process using the claimed substrates together with the specific recited enzymes as to directly arrive at L-ascorbic acid without an intermediate (such as 2-KGA). Thus, Hancock also does not fill the gap in Asakura. And, the combination of the both Hancock and Boudrant also does not fill the gap in Asakura.

Thus, Asakura either alone or in combination with Boudrant and/or Hancock neither discloses nor suggests the currently claimed process. For this reason alone, the rejection should be withdrawn.

In addition to the factually deficient nature of the rejection, we also note that the rejection is legally flawed as well. The rejection takes as a given that Asakura, Boudrant, and Hancock are properly combinable. Evidence of this is clearly set forth in the rejection: "Combining the teachings of the above references, it would have been obvious ... to develop a process ...." (Paper No. 20060728 at 12). There is no evidence in the rejection analyzing whether or why the documents are properly combinable.

A *prima facie* case of obviousness requires that the rejection describe with specificity **why** one skilled in the art would have combined the references to arrive at the claimed invention. *In re Dembiczak*, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999) ("Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of *the requirement for a showing of the teaching or motivation to combine prior art references.*"). In the present case, no such explanation is found in the rejection. For this reason also, the rejection is deficient and should be withdrawn.

The rejection is also devoid of any discussion of the dependent claims separate from the independent claims. Accordingly, the record is devoid of any evidence that the Examiner individually considered the dependent claims. It is axiomatic, however, that a dependent claim is not *per se* obvious based on prior art that allegedly makes obvious the base claim. Accordingly, "[e]xaminers are reminded that a dependent claim is directed to a combination including everything recited in the base claim and what is recited in the dependent claim. ***It is this combination that must be compared with the prior art, exactly as if it were presented as one independent claim.***" MPEP § 608.01(n) (8th ed., Rev. 5, Aug. 2006, pp. 600-91). This the Examiner has not done. Accordingly, the rejection is also both factually and legally deficient as to the dependent claims. For this additional reason, the rejection should be withdrawn as to the dependent claims.

Accordingly, for the reasons set forth above, entry of the amendments, withdrawal of the rejections, and allowance of the claims are respectfully requested. If the Examiner has any questions regarding this paper, please contact the undersigned.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on February 12, 2007.

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